

WHAT IS CLAIMED IS:

1. A composition, comprising:
a particle chain having at least two connected particles, wherein at least one of the at least two connected particles has an interior region with a density of large pores and a surface region with a density of large pores, and the density of large pores of the interior region is greater than the density of large pores at the surface region.
2. The composition of claim 1, wherein each of the at least two connected particles has a diameter of from about ten microns to about 3,000 microns.
3. The composition of claim 1, wherein the particle chain has a restrained length of at most about 50 centimeters.
4. The composition of claim 1, wherein the particle chain has a restrained length of at least about one centimeter.
5. The composition of claim 1, wherein the at least two connected particles are connected by a link.
6. The composition of claim 1, wherein the at least two connected particles are connected by a link having a length of at most about 50,000 microns.
7. The composition of claim 1, wherein the at least two connected particles are connected by a link having a length of at least about one micron.
8. The composition of claim 1, wherein the at least two connected particles are connected by a link having a width of at most about 0.01 inch.
9. The composition of claim 1, wherein the at least two connected particles are connected by a link having a width of at least 0.001 inch.

10. The composition of claim 1, wherein the at least two connected particles are connected by a link having an aspect ratio of at most about 1,000.

11. The composition of claim 1, wherein the at least two connected particles are
5 connected by a link having an aspect ratio of at most 25.

12. The composition of claim 1, wherein the at least two connected particles are connected by a link having an aspect ratio of at least 0.001.

10 13. The composition of claim 1, wherein the at least two connected particles are connected by a link and a ratio of the diameter of one of the at least two particles to a width of the link is at most about 100.

14. The composition of claim 1, wherein the at least two connected particles are
15 connected by a link and a ratio of the diameter of one of the at least two particles to a width of the link is at least about 0.5.

15. The composition of claim 1, wherein the at least two connected particles are connected by a link comprising a polymer or a metal.

16. The composition of claim 1, wherein the at least two connected particles are
20 connected by a link comprising a fiber.

17. The composition of claim 1, wherein the at least two connected particles are
25 connected by a link comprising a material that is different from a material of at least one of the particles.

18. The composition of claim 1, wherein the at least two connected particles are
30 connected by a link and the link is integrally formed with at least one of the particles.

19. The composition of claim 1, wherein the at least two connected particles are connected by a link and the link is attached to at least one of the particles.

20. The composition of claim 1, wherein the at least two connected particles are
5 connected by a polymer link that is grafted to the particles.

21. The composition of claim 1, wherein the at least two connected particles include a first particle comprising a first polymer and a second particle comprising a second polymer, and the first polymer is the same as the second polymer.

22. The composition of claim 1, wherein the at least two connected particles include a first particle comprising a first polymer and a second particle comprising a second polymer, and the first polymer is different from the second polymer.

23. The composition of claim 1, wherein the at least two connected particles
15 comprise first and second particles, and a diameter of the first particle is the same as a diameter of the second particle.

24. The composition of claim 1, wherein the at least two connected particles
20 comprise first and second particles, and a diameter of the first particle is different from a diameter of the second particle.

25. The composition of claim 1, wherein the composition further comprises a carrier fluid.

26. The composition of claim 25, wherein the carrier fluid comprises a saline solution.

27. The composition of claim 25, wherein the carrier fluid comprises a contrast
30 agent.

28. The composition of claim 25, wherein the at least two connected particles have an arithmetic mean diameter of about 3,000 microns or less.

29. The composition of claim 25, wherein the at least two connected particles have an arithmetic mean diameter of about ten microns or more.

30. The composition of claim 1, wherein the particle chain has a two-dimensional structure.

31. The composition of claim 1, wherein the particle chain has a three-dimensional structure.

32. A method, comprising:
forming a mixture containing a polymer and a gelling compound; and
treating the mixture to form a particle chain including at least two connected particles, wherein at least one of the at least two connected particles has an interior region with a density of large pores and a surface region with a density of large pores, and the density of large pores of the interior region is greater than the density of large pores at the surface region.

33. The method of claim 32, further comprising forming drops of the mixture.

34. The method of claim 33, further comprising contacting the drops with a gelling agent.

35. The method of claim 34, further comprising reacting the polymer.

36. The method of claim 35, further comprising removing the gelling compound.

37. The method of claim 32, further comprising combining the particles with a pharmaceutically acceptable medium.

38. The method of claim 32, further comprising grafting a second polymer to the at least two particles to form a link between the particles.

5 39. The method of claim 32, further comprising forming a stream of the mixture and treating the stream with a gelling agent.

40. The method of claim 32, further comprising forming a laminar stream of the mixture and exposing the stream to a non-uniform frequency.

10 41. A method, comprising:
administering to a patient a therapeutically effective amount of a composition comprising a particle chain having at least two connected particles, wherein at least one of the at least two connected particles has an interior region with a density of large pores and a
15 surface region with a density of large pores, and the density of large pores of the interior region is greater than the density of large pores at the surface region.

42. The method of claim 41, wherein the method of administration is by percutaneous injection.

20 43. The method of claim 41, wherein the method includes embolizing a body lumen.

44. The method of claim 41, wherein the method includes embolizing a body
25 lumen associated with a cancer condition.

45. A method of forming a particle chain having at least two linked particles, the method comprising:

30 forming the at least two particles in at least two particle cavities in a mold; and
forming a link between the at least two particles in a link cavity in the mold that connects the at least two particle cavities, to form the particle chain.

46. A method of forming a particle chain having at least two linked particles, the method comprising:

disposing a filament of material through at least two cavities in a mold; and

5 forming the at least two particles in the cavities so that the at least two particles are linked by the filament to form the particle chain.

47. A composition, comprising:

10 a particle chain having at least two adjacent particles that are connected by a filament, wherein at least one of the at least two adjacent particles comprises a polymer that can change shape to change the length of the filament between the at least two adjacent particles.

48. The composition of claim 47, wherein at least one of the at least two adjacent particles comprises a shape-memory material or a superabsorbable polymer.

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